REMARKS/ARGUMENTS

Double Patenting Rejection of Claims 25 to 40

A Terminal Disclaimer is being filed concurrently herewith to overcome the double patenting rejection over commonly owned USP 6,632,295.

The double patenting rejection over USP 6,663,725 is an improper rejection prohibited by statute. The claims pursued in this application are non-elected invention in parent application USP 6,663,725 and a rejection based on USP 6,632,295 is therefore specifically precluded by Patent Law (see 35 USC 121).

Discussion of Rejection of the Art

The invention of claims 17-24 provides improved ductility of high strength hot dip zinc-coated steel sheet having 440 MPa or higher strength as described in the present specification (Embodiment 2, page 22). The invention of claims 25-40 is to prevent the surface defects of high strength steel sheet having strength of 340 MPa or more without deteriorating the

workability. The surface defects are those caused by the cracks appearing on the surface or below the surface of the slab as a result of bending deformation during continuous casting as described in the present specification (Embodiment 3, page 31).

In order to attain the special properties of the steel of the present invention, it is necessary to control not only the chemical composition, but also the manufacturing conditions, especially the cooling conditions after hot rolling. The requirement to control both the composition and manufacturing conditions to attain the invention objects is not shown or suggested in the art. Nor does the art provide any other reason to meet the requirements of the present claims.

Claims 17-40 are rejected over Ushioda (USP 5,486,241). Of these, claims 17-24 are rejected only over Ushioda (USP 5,486,241). The remaining claims 25 to 40 are rejected over Ushioda alone, or are rejected over Tosaka (USP 5,587,027), Takahashi (USP 4,436,561) or for claims 25-32, over Bono (USP 5,873,957). Arguments made below are separately directed against the rejection of claims 17 to 24 and the rejection of claims 25 to 40.

Claims 17 to 24

There is a great difference in carbon content between the present invention steel (0.01 to 0.3%) and Ushioda's steel (0.0001 to 0.0015%).

This difference is more than just an arbitrary difference.

As described in the original specification (page 22, line 8 to 10 from the bottom), 0.01% or more of carbon content is absolutely necessary to obtain the strength of 440MPa or more. In fact, all the specification examples have the strength of 597MPa or more as shown in Table 9 (page 30). On the contrary, Ushioda shows no example having strength as high as the present invention examples show for the claimed invention.

Therefore, it is submitted that the present invention is different from Ushioda in an unobvious way to provide steel with special properties.

Claims 25 to 40

Claim 25 requires "0.005% or less S" and "cooling speeds of from 120 to 2000°C/sec", respectively. (See also the specification page 33, lines 4 to 13 and page 35, lines 1 to 4, respectively).

Compared with Ushioda, the steel claimed in claim 25 has a large difference of carbon content: present invention steel (0.05 to 0.2%); Ushioda's steel (0.0001 to 0.0015%). This is a significant difference as explained above. Also Tosaka's steel has a much lower carbon content (0.0015 to 0.0100%).

Furthermore, as described in the specification (page 32, lines 2 to 5), 0.05% or more of carbon content is absolutely necessary to suppress the crack occurrence on the surface or below the surface of the slab under bending deformation during continuous casting.

Therefore, the present invention is not shown or suggested by Ushioda or by Tosaka.

Takahashi does not specify the content of S in the claims, but shows 0.01% or more of S in the example (Table 1). This is outside the present claims. As shown in Tables 10 and 11, inventive Steel Nos. 7 and 12 containing 0.01% or more of S have a poor surface property. Thus, the present invention provides superior properties on this basis, as compared with Takahashi.

Therefore, it is submitted that the present invention is not shown or suggested by Takahashi.

Bono specifies at most 80°C/sec of the cooling speed after hot rolling in his claim. This is outside the present invention claims.

As shown in the attached Figure, which shows data calculated using the data of λ and TS of Table 12, the high value of λ X TS (that is, good workability) can be obtained at a cooling rate of 120°C/sec or more. Therefore, the present invention is not shown or suggested by Bono.

Takahashi also specifies 10 to 150°C/sec of the cooling speed after hot rolling in his claim, but no examples of the cooling speed are shown.

As was noted above, and evidenced by the data in the specification, the present invention requires a selection not only of composition parameters, but also manufacturing conditions to attain the invention object. Therefore, the Examiner's reasoning that it would be obvious to select variable from the broad art disclosure is not supported without some indication as to how to select or why one should select appropriate parameters.

In view of the above, it is submitted that the present invention is not shown or suggested by the cited art. Withdrawal of the rejections and allowance of the application are respectfully requested.

Respectfully submitted,

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Encs. Figure, showing data using the data of λ and TS of Table 12

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